Department of Resources Recycling and Recovery

SCOPE OF WORK

Use of Reclaimed Asphalt Pavement in Rubberized Hot Mix Asphalt and Rubberized Chip Seal

I. INTRODUCTION/OBJECTIVES

This research contract has two primary objectives. First, Rubberized Hot Mix Asphalt (RHMA) specifications have not permitted the inclusion of reclaimed asphalt pavement (RAP). RAP is asphalt concrete that has been removed from the roadway, most commonly by cold milling, and stockpiled similar to an aggregate. More RAP is generated currently than can be used in new conventional asphalt concrete pavement. This project will analyze the use of RAP in RHMA through preparation of mix designs and placement of RHMA sections both with and without RAP. These sections will, over their lifecycle, provide a comparison of performance.

Second, hot-applied chip seals using asphalt rubber or modified paving asphalt binders use screenings (high quality crushed rock) as cover aggregate. This rock is produced from virgin sources and in some areas, is not readily available. In addition, the screenings must be pre-coated with paving asphalt and heated prior to delivery. RAP can be crushed and screened to produce screenings of the gradation for use on chip seals. This project will analyze the use of RAP as a cover aggregate on a chip seal using terminal blend binder. This project may potentially demonstrate that RAP can be used as cover aggregate on hot-applied chip seals, thus using a recycled rather than virgin material, and saving the material and energy resources consumed in pre-coating and pre-heating.

II. WORK TO BE PERFORMED

This project will entail the following tasks: determine project location; develop specifications, mix design and quality assurance (QA) testing program; construct test sections of RHMA with and without RAP and chip seal with RAP screenings, perform QA tests; prepare project report.

III. TASKS IDENTIFIED

Rubberized Hot Mix Asphalt with 15 Percent RAP

1. Identify RHMA potential project sites - Contractor shall select a roadway that is typically a collector or arterial highway with a moderate traffic index (T.I.) of 8 or less, in fair condition, with a pavement condition index (PCI) of 55 to 70, and long enough to have both segments of RHMA with and without RAP. Segments shall be 1/2 mile to one mile in length. Contractor shall collect pavement condition data and obtain cores. Contractor shall perform deflection testing if necessary to determine structural condition.

2. Develop specifications, mix designs and quality assurance testing program - Subject to CalRecycle Contract Manager approval, Contractor will develop special provisions modifying the current specifications in the Standard Specifications for Public Works Construction. In consultation with a material testing consultant to be retained by Contractor, Contractor will establish parameters of mix designs and prepare mix designs with and without RAP. An objective of this phase will be to determine the effect of the residual paving asphalt of the RAP on the binder content of the mix. The inclusion of RAP may offer a way to raise the overall binder content without increasing the amount of paving asphalt used. Contractor shall develop a plant and field testing program in consultation with a material testing consultant.

3. Production and placement of RHMA containing RAP - Implement the quality assurance program, which includes inspection and testing at the production site and at the placement site. The specific testing and frequency is determined during Task 2. Contractor shall observe placement. Contractor shall record the delivery and placement temperatures, and any problems or issues during placement. (approximately 2,000 tons of RHMA)

4. Prepare and submit final RAP in RHMA final report - Contractor shall prepare and submit to CalRecycle a project report including existing pavement condition data, before and after photos, mix designs, and quality assurance test data.

Terminal Blend Chip Seal Using RAP Screenings

5. Identify potential chip seal project sites - Contractor shall identify roads in the Antelope Valley area of Los Angeles County suitable for chip sealing and shall select roadways that are typically a collector or arterial highway with a moderate traffic index (T.I.) of 8 or less, and in fair condition, pavement condition index (PCI) of 50 to 70. Contractor shall collect pavement condition data and obtain cores. Contractor shall perform deflection testing if necessary to determine structural condition.

6. Develop specifications, and quality assurance testing program - Subject to approval by CalRecycle Contract Manager, Contractor shall develop special provisions modifying the current specifications in the Caltrans Standard Specifications for Public Works Construction. Contractor shall also develop a quality assurance program (plant and field testing, and field observation). Contractor shall procure materials and equipment for use by Los Angeles County Department of Public Works Personnel (County forces).

7. Chip seal placement - County forces, supplemented by vendors, will place the chip seal. Contractor shall implement the quality assurance program and observe placement. Contractor shall record the delivery and placement temperatures, and any problems or issues during placement. (approximately four lane-miles)

8. Prepare and submit chip seal final report - Contractor shall prepare and submit to CalRecycle a project report including existing pavement condition data, before and after photos, specifications, and quality assurance test data.

IV. CONTRACT/TASK TIME FRAME

Task	Duration	Final Due Dates
1. Identify RHMA potential project sites	1 month	10/1/11
2. Develop RHMA specifications, mix designs and QA testing program	4 months	2/1/12
3. Production and placement of RHMA containing RAP	2 months	10/1/12
4. Prepare and submit final RAP in RHMA project report	3 months	1/15/13
5. Identify potential chip seal project sites	1 month	10/1/11
6. Develop specifications, and QA testing program	6 months	4/1/12
7. Chip seal placement	1 month	10/1/12
8. Prepare and submit Chip Seal final report	3 months	1/15/13

V. COPYRIGHT PROVISION

The contractor shall establish for CalRecycle good title in all copyrightable and trademarkable materials developed as a result of this Scope of Work. Such title shall include exclusive copyrights and trademarks in the name of the State of California, Department of Resources Recycling and Recovery.

VI. CALIFORNIA WASTE TIRES

Unless otherwise provided for in this Scope of Work, in the event the contractor and/or subcontractor(s) purchases waste tires or waste-tire derived products for the performance of this Scope of Work, only California waste tires and California waste tire-derived products shall be used. As a condition of payment under the agreement, the contractor shall be required to provide documentation substantiating the source of the tire materials used during the performance of this Scope of Work to the CalRecycle Contract Manager.

VII. WASTE REDUCTION AND RECYCLED-CONTENT PRODUCT PROCUREMENT

In the performance of this Agreement, Contractor shall use recycled content, used or reusable products, and practice other waste reduction measures where feasible and appropriate.

Recycled Content Products: All products purchased and charged/billed to CalRecycle to fulfill the requirements of this contract shall be Recycled Content Products (RCPs), or used (reused, remanufactured, refurbished) products. All RCPs purchased or charged/billed to CalRecycle to fulfill the requirements of the contract shall have both the total recycled-content (TRC) and the postconsumer content (PC) clearly identified on the products. Specific requirements for the

aforementioned purchases and identification are discussed in the Terms and Conditions of the Contractual Agreement under Recycled-Content Product Purchasing and Certification.

The Contractor should, at a minimum, ensure that the following issues are addressed, as applicable to the services provided:

A. WRITTEN DOCUMENT PROVISION

All documents and/or reports drafted for publication by or for CalRecycle in accordance with this contract shall adhere to the CalRecycle's *Guidelines For Preparing CalRecycle Reports* (available upon request) and shall be reviewed by CalRecycle's Contract Manager in consultation with one of CalRecycles's editors.

In addition, these documents and/or reports shall be printed double-sided on one hundred percent (100%) recycled-content paper. Specific pages containing full-color photographs or other ink-intensive graphics may be printed on photographic paper. The paper should identify the postconsumer recycled content of the paper (i.e., "printed on 100% postconsumer paper"). When applicable, the contractor shall provide the CalRecycle Contract Manager with an electronic copy of the document and/or report for CalRecycle's uses.

To the greatest extent possible, soy ink instead of petroleum-based inks should be used to print all documents.